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| 09/916,247 | 07/30/2001 | Pierre Cote | 4320-347 | 9131 |
| 7590 Scott R. Pundsack Bereskin & Parr Box 401 40 King Street West Toronto, ON M5H 3Y2 CANADA | | | EXAMINER MENON, KRISHNAN S | |
| | | | ART UNIT 1723 | PAPER NUMBER |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | MAIL DATE | DELIVERY MODE | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 09/916,247 | Applicant(s) COTE ET AL. | |
| | Examiner Krishnan S. Menon | Art Unit 1723 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 26-36 are pending as appealed on 3/3/06.

PROSECUTION IS HEREBY REOPENED in accordance with the remand by the Board of Patent Appeals and Interferences of 2/16/07 to vacate the 35 USC 103(a) rejection of claims 29,30 and 32, and consider 35 USC 103(a) rejection of claims 26-32 over Smith and/or Del Vechio, singly or in combination.

Double Patenting

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 26-29, 31 and 33 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-6 of copending Application No. 11/106,681. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a

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patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 26-36 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 7-23 of copending Application No. 11/106,681. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in both applications recite process for filtering water containing solids and cleaning an immersed membrane system. The basic process steps are similar, except for minor variations in the concentrations of the cleaning chemicals and/or the periods/periodicity of various process steps, which are within the skill of one of ordinary skill in the art.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 26-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US 5,403,479) in view of Del Vechio et al (US 6,331,251).

Smith (479) teaches a process of filtering water containing solids by immersing a membrane in a tank at ambient pressure (col 2 lines 63-66 and col 1 lines 53-66) containing the water and providing a trans-membrane pressure, with permeate side subjected to a negative pressure relative to the feed side for the filtration (Fig 2,7; col 15 line 63-col 16 line 10; see abstract of the reference incorporated in col : US, 5,248,424 to Cote. Et al.), with the permeate side connected to permeate outlet (line 22, and tank 27, fig 2), the membrane aerated (col 16 lines 20-25), backwashing, with wetting the membrane at least once a week (periodicity of this step can be seen in Fig 4) with a cleaning fluid of select concentration, periodically for a select period (col 15 table, lines 16-47, col 18 lines 13-29; col 11 lines 22-61).

Re the limitations 'and a retentate in the tank', it is inherent; what remains in the tank is 'retentate' after 'permeate' is removed from the feed by the process.

Backwashing is done after the permeation step (see col 11 lines 22-61).

Regarding the draining of the tank wholly or partially, and during or after backwashing, Smith discusses about draining the tank in detail during cleaning in the "back-ground of the invention", but teaches that draining the tank can be eliminated during the cleaning process if the use of the cleaning agents is controlled so as not to affect the permeate quality (col 10 lines 64-68, col 11 lines 22-61). A reference may be

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relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including nonpreferred embodiments. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). See also *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998). Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (In re *Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971)). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use. In re *Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). Also, a reference is no less anticipatory if, after disclosing the invention, the reference then disparages it. The question whether a reference "teaches away" from the invention is inapplicable to an anticipation analysis. *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998).

Re when to drain the tank, the 'Markhush group' claim language "either before the other or partially or simultaneously" covers all the possibilities there are: before, during or after the cleaning step, and fully or partially; and therefore, if not anticipated by Smith, would be obvious to one of ordinary skill in the art. Please see the Del Vechio reference as further evidence to this prima facie case.

Del Vechio teaches the process as claimed in claim 26 (for details, see the rejection in paragraph 4 below), including the draining step. Del Vachio subsequently teaches that the draining of the tank [of the cleaning solution] can be avoided and

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directly proceeded to normal operation if the cleaning solution is consumed or neutralized during the cleaning operation, or if its toxicity would not unduly inhibit the activity of the bio-mass.

Smith's teaching is a step farther: Smith teaches that by following his method there is no need to drain the tank at all; and his method reads on to claim 26 but for the draining step. It is respectfully submitted that draining the tank of its contents for cleaning purposes is well known in the art for ages; one of ordinary skill would assume draining the tank before cleaning, draining the tank of the cleaning chemicals and rinsing it as process steps that one would naturally follow. Smith teaches what is being followed in the industry, which includes draining the tank, and his process as an improvement where in he has determined that such draining is not necessary because the cleaning chemicals can be controlled so that it would not adversely affect the process or hurt the activity of the biomass (column 11 lines 22-61). Thus, if Smith does not anticipate the claim, it definitely would make it obvious.

In addition, one of ordinary skill in the art would also use the teaching of Del Vechio in the teaching of Smith to drain the tank of the wastewater (substrate) for extreme rigorous cleaning when needed, and drain and rinse the tank and membrane after cleaning, if such cleaning would be detrimental to the biomass in the substrate.

Claim 27: The cleaning is between once a day and once a cycle (see fig 6; col 13 lines 50-57). Draining the tank would be obvious, as shown above.

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Claim 28: The cleaning is carried out to maintain an acceptable permeability of the membrane as in instant claim 28 (col 13 lines 50 – 57, col 18 lines 5-12) and the cleaning steps from time to time is to increase the flux and reduce the rate of decline of flux in Smith (col 10 lines 64-68, col 11 lines 22-30). It would be obvious to one of ordinary skill in the art at the time of invention to optimize the cleaning cycles depending on the condition of the feed water, such as composition of the biomass, rate of growth of biofilm, etc., as taught by Del Vechio – see column 12, 12-47, and Smith.

Claims 29 and 30: The sum of the products of chemical concentration and duration of cleaning between 5,000 and 10,000 min.mg/L or equivalent for another cleaning chemical (col 11 lines 30-35: time less than an Hr, sufficient to diffuse enough cleaning solution ... ; table line 9: NaOCl at 100 ppm, col 15 lines 34-36: cleaning solution at 10 ppm; these provide the CT values within the claimed range of 2000-20,000 min.mg/L per week for at least one month). Also, these ranges are optimizable depending on the water quality and membrane flow rates. In re Boesch and Slaney.

Claim 31: recovery cleaning at least one month apart: Figure 4 gives more and less rigorous alternatives for cleaning over a 15-day period, and Smith teaches the cleaning process as a periodic process (col 1 lines 18-22). It may be noted that the type and frequency of cleaning would depend on the water quality and the fouling characteristics of the membrane, and one of ordinary skill in the art could optimize it. Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Boesch and Slaney, 205 USPQ 215 (CCPA

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1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955).

Claim 32: permeate is used as drinking water: intended use of the product made: Smith ref teaches purifying "ground water" in col 20 lines 35-43. Ground water is well known as a source of drinking water. [Also, please note that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)]. Cleaning chemical is an oxidant – hypochlorite is an oxidant.

Claims 33-35: cleaning at regular intervals, mixing cleaning chemicals in flowing water in permeate side: see abstract and figures of Smith. Re mixing cleaning chemical in flowing water, Smith teaches flowing water containing the cleaning chemical, the cleaning chemical being mixed in the water in a feed tank, which is equivalent. Re backwashing with permeate after backwashing with cleaning chemical, see col 12 lines 56-68. Del Vecchio also teaches the same in column 11, 59-67, and column 12.

Claim 36: Membrane is hollow fiber in smith – see abstract.

4. Claims 26-28, 31 and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Del Vecchio et al (US 6,331,251).

Claim 26: Del Vecchio teaches a process of filtering water containing solids using immersed membranes (see abstract and figures) by creating a trans-membrane pressure with permeate side at a lower pressure as claimed, retentate remains in the tank (Please note that Del Vecchio uses the term “substrate” for the contaminated water to be cleaned). Membrane is aerated during normal operation and for cleaning (see column 6 lines 15-28, column 7 line 64 – column 8 line 5 and column 11 lines 9-31). Backwashing the membrane (reverse flow cause permeate to flow in the opposite direction) – column 11 lines 31-46. Draining the tank – column 11 lines 46-58. Tank is drained after the cleaning cycle also – see column 12 lines 40-48. (Claim language is open to cleaning at any time: during, before or after the backwashing cycle. Draining the tank before or after the deep cleaning in the reference happens after a backwash cycle). Pulsed cleaning can also be introduced during the deep cleaning – see column 12 lines 30-40: this would be back flush when the tank is in the drained state. The “wetting of the membrane with a cleaning chemical” is the soaking step in the reference – the membrane is wet with a cleaning chemical in this step. Column 11 lines 59-67, column 12 lines 12-30.

The reference teaches several process steps in the “deep cleaning” process, such as draining the tank, then soaking the membrane in a cleaning chemical solution, for duration depending on the wastewater conditions (substrate, constituents of the biomass, and other factors), which can be repeated once a month, or more frequently as desired; additional steps of adding membrane air, and pulse cleaning with or without

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cleaning chemical. Of these, the soaking and the use of membrane air meets the recitation of steps (ii) and (f) of claim 26.

Regarding the frequency of cleaning, the reference teaches a frequency of about once a month, or at more or less frequent intervals, depending on the needs of the system and the rate at which the biofilm is generated on the fibers – see column 12 lines 12-30. Thus, even if the reference does not specifically teach once a week cleaning cycle, the frequency could be optimized for the process conditions, which would be obvious to one of ordinary skill in the art.

It would be obvious to one of ordinary skill in the art at the time of invention to increase or decrease the intensity, duration and frequency of cleaning required depending on the process conditions, such as the quality of the wastewater, composition of the biomass, rate of generation of the biofilm, and other factors, as taught by Del Vechio.

Claim 27: part (i) repeated at least once a day – see column 10 lines 4-8 (pulse cleaning is with backwash). Step (f) (wetting, or deep cleaning in the reference) is repeated, and duration and frequency can be selected depending on the need of the system – column 12 lines 12-30.

Claim 28, 31: recovery cleaning – the deep cleaning, or deep cleaning with additional back-flush cleaning (column 12 lines 30-40) can be recovery cleaning, depending on need. One month apart – column 12 lines 19-22. The claims do not recite any specific steps for the recovery cleaning. Applicant describes the recovery

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cleaning in paragraph (0008) of the Pre-Grant Publication as (that described in US patent 5,403,479 to Smith et al):

“Permeation is stopped and the membranes are cleaned by continuously flowing a specified amount of chemical cleaner in a reverse direction through the membranes for an extended period of time while the membranes remain immersed in the wastewater and are simultaneously agitated.”

This description only shows repeating the weekly cleaning cycle with more intensity and/or duration once a month. This resembles the Del Vechio teaching of the reference in column 12, 30-40. ***It would be obvious to one of ordinary skill in the art at the time of invention to increase or decrease the intensity, duration and frequency of cleaning required depending on the process conditions, such as the quality of the wastewater, composition of the biomass, rate of generation of the biofilm, and other factors, as taught by Del Vechio.***

Claim 34: back washed with permeate after step (f) – see column 12 lines 30-40. This step would be after “wetting” (or soaking – see column 12 lines 12-15) the membrane, and before returning to step (b). The reference also teaches draining the tank of the cleaning chemicals in column 12, lines 40-48. It would be obvious to one of ordinary skill in the art at the time of invention also to back flush with water to remove the cleaning chemical if required. The reference teaches that the cleaning chemical remaining in the system could also be consumed or neutralized by the wastewater; the only requirement is that the it should not unduly inhibit the activity of the bio-mass.

Claim 35: flowing permeate to the permeate side – the reverse flow step in pulse cleaning. Mixing cleaning chemical in flowing permeate water – see column 11 lines

62-65: chemical is mixed into the permeate in line 292, which is the permeate line that can flow back into the tank through line 296, or to the permeate side of the membrane through line 294. Column 12 lines 30-40 teaches reverse flow of permeate with cleaning chemical.

Claim 36: Hollow fiber membrane – treatment system same as that of the applicant's – see column 1 lines 23-33.

5. Claims 29,30,32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Del Vecchio as applied to claim 26 above, and further in view of Smith'479.

Instant claims differ from the teaching of Del Vecchio in reciting the cleaning chemical comprising an oxidant, the range of the min.mg/L of the cleaning chemical and that the permeate is intended as drinking water. Permeate intended as drinking water is intended use of the product made, and is not a patentable limitation. See, e.g., In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963) (The claims were directed to a core member for hair curlers and a process of making a core member for hair curlers. Court held that the intended use of hair curling was of no significance to the structure and process of making.). Del Vecchio teaches using chlorine as preferred, which is an oxidant (column 9 lines 43-48). Smith teaches using chlorine or hypochlorite as cleaning chemical in a similar process – see column 12 lines 9-25, column 15 lines 1-47, and examples. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Smith in the teaching of Del Vecchio for the cleaning chemical because Del Vecchio does not specify a composition for the

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cleaning chemical, and Smith provides the details of the use of the cleaning chemical for the same or similar process. Also chlorine and hypochlorite are equivalent in their oxidation action – both work by releasing nascent oxygen to oxidize the bio-foulants.

Claim 33: Step (f) performed at regular intervals with same product of concentration and duration – this is implied in column 12 lines 10-30. “[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom.” In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968); In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "K S Menon", followed by the date "2/23/07" written in a similar cursive style.

Krishnan S Menon
Primary Examiner
Art Unit 1723